TECHNICAL REVIEW DOCUMENT
For
RENEWAL / MODIFICATION TO OPERATING PERMIT 95OPRB091

Colorado Interstate Gas Company
Greasewood Compressor Station
Rio Blanco County
Source ID 1030055

Prepared by Blue Parish
July - October 2009
Revised December 21, 2009 to include Regulation No 7 Section XVII.E offramp demonstration

I. Purpose:

This document establishes the basis for decisions made regarding the applicable requirements, emission factors, monitoring plan and compliance status of emission units covered by the renewal and modification of the Operating Permit for the Colorado Interstate Gas Company (CIG) Greasewood Compressor Station. The original Operating Permit for this facility was issued on February 1, 2009, was renewed on February 1, 2004 and expired on February 1, 2009. However, since a timely and complete renewal application was submitted, under Colorado Regulation No. 3, Part C, Section IV.C all of the terms and conditions of the existing permit shall not expire until the renewal operating permit is issued and any previously extended permit shield continues in full force and operation. Prior to submittal of the renewal application, the source had submitted an application on April 30, 2007 to revise their Title V permit to:

- Add one (1) Solar Centaur 40-4700 turbine permitted under Colorado Construction Permit No. 05RB0312,
- Revise the serial number for the Allison 501-KC5 turbine (CG-1) to reflect the replacement gas producer which was exchanged during routine maintenance as reported to the Division on an APEN on March 19, 2007,
- Correct the nitrogen oxide emission limit for the Allison 501-KC5 turbine (CG-1) to 84.4 tons per year (from 84.1 tons per year) to match the emission factor in the existing permit,
- Correct listed model numbers and serial numbers, and
- Update the list of insignificant activities.

The modification to incorporate the conditions of Construction Permits 05RB0312 Modification No. 1 and 08RB0591represents a significant change in existing monitoring permit terms; therefore the modification must be processed as a significant modification as required by Colorado Regulation No. 3, Part C, Section I.A.7.f. A significant modification is processed under the same procedures as a renewal, i.e. it must go through a 30-day public comment period and EPA 45-day review period. Therefore,

since the renewal application has been submitted the Division is incorporating the modification with the renewal.

This document is designed for reference during review of the proposed permit by EPA and for future reference by the Division to aid in any additional permit modifications at this facility. The conclusions made in this report are based on the source's request for a modification submitted on April 30, 2007, the renewal application submitted on August 3, 2007, additional information submitted on July 31 2009, August 3, 5 & 6, 2009, comments on the draft permit submitted on September 30, 2009, previous inspection reports and various e-mail correspondence, as well as telephone conversations with the applicant. Please note that copies of the Technical Review Document for the original permit and any Technical Review Documents associated with subsequent modifications of the original Operating Permit may be found in the Division files as well as on the Division website at http://www.cdphe.state.co.us/ap/Titlev.html. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Description of Source

This source is classified as a natural gas transmission facility defined under Standard Industrial Classification 4922. The equipment within the Greasewood Compressor Station are named according to the services they provide for billing purposes and company reference. Two (2) internal combustion engines are used for "Parachute" compression services. One (1) turbine is used for "Greasewood" compression services. A third compressor engine is used to provide additional capacity out of the Piceance Basin for current customers. All other equipment on site serves both compression services.

The source is located in rural Rio Blanco County about six miles north of Piceance Creek on County Road 76, or roughly 20 miles northwest of the town of Rio Blanco, CO. The area in which the plant operates is designated as attainment for all criteria pollutants. The source is within 50 miles of Utah. Flat Tops National Wilderness Area, a Federal Class I designated area, is within 100 kilometers of the plant.

The summary of emissions that was presented in the Technical Review Document (TRD) for the previous permit issuance has been modified to update the potential to emit (PTE) based on the addition of the two turbines permitted under Construction

Permits 05RB0312 and 08RB051, and the requested revisions to the permitted emission limits for the Allison Turbine (CG-1). Actual emissions are also updated.

Permitted emissions (in tons/yr) at the facility are as follows:

Pollutant	Potential to Emit (tpy)	Actual Emissions (tpy)
NO_x	242.4	41.0
VOC	25.0	1.2
CO	113.7	24.9
Formaldehyde	5.98	0.68
Total Hazardous Air Pollutants (HAP)	8.45	1.32

Potential emissions for NOx, VOC and CO are based on permit limits. Potential formaldehyde and other HAP emissions are based on AP-42 Emission Factors (Chapter 3.1 for turbines (April, 2000) and Chapter 3.2 for engines (April, 2000). Actual emissions are based on APENs submitted for data year 2008. Attachment 1 includes more information on facility emissions.

MACT Applicability

The technical review document for the original Title V operating permit indicates that HAP emissions are below major source levels. Based on conservative published emission factors and the HAP emission factors identified in the proposed MACT for combustion turbines, the Division considers that this facility is still a minor source for HAPS.

MACT YYYY: 40 CFR 63 Subpart YYYY includes requirements for stationary combustion turbines located at major sources of HAPs. The facility is not a major source of HAPs and therefore Subpart YYYY does not apply.

MACT ZZZZ: 40 CFR 63 Subpart ZZZZ includes requirements for reciprocating internal combustion engines (RICE). Subpart ZZZZ was amended on January 18, 2008 to include requirements for RICE at area sources of HAPs. RICE located at the facility include three (3) four stroke lean burn engines used for compression (CG-2, CG-3 and CG-4), and two (2) four stroke lean burn emergency generators.

The compression engines commenced construction prior to June 12, 2006 and are therefore defined as existing engines under Subpart ZZZZ. As per 40 CFR 63.6590(b)(3), existing four stroke lean burn RICE located at area sources of HAPs are not subject to the requirements of Subpart ZZZZ or the general requirements of 40 CFR 63 Subpart A, and are also not required to submit an initial notification.

The first emergency generator (EG-1) was constructed in 1994 and is also considered existing under Subpart ZZZZ. The newest emergency generator (EG-2) was constructed after June 12, 2006, which qualifies it as a new four stroke lean burn

emergency engine at an area under Subpart ZZZZ. Such engines must meet the requirements of NSPS JJJJ (40 CFR 63.6590(c)).

Colorado Regulation No. 7 Applicability

Colorado Regulation No. 7, Section XVII.E includes included provisions to exempt existing (constructed or modified before February 1, 2009) lean burn engines from control requirements if their owners and operators could demonstrate that the cost of controls would exceed $ 5,000 per ton and that such demonstration must be submitted by August 1, 2009. The source submitted a request for such an exemption on July 30, 2009 and in a December 21, 2009 letter, the Division agreed that the exemption applied to engines CG2, CG3 and CG4.

New Source Performance Standards (NSPS) Applicability

NSPS JJJJ: 40 CFR 63 Subpart JJJJ includes requirements for owners or operators of reciprocating combustion engines that commence construction, modification or reconstruction after June 12, 2006. As described above, only the newest emergency generator (EG-2) commenced construction after June 12, 2006. Emergency engines greater than 25 hp manufactured on or after January 1, 2009 are subject to requirements under NSPS JJJJ (40 CFR 60.4230(a)(4)(iv)). According to information provided by the applicant, EG-2 is a model year 2007 engine is therefore not subject to any requirements under Subpart JJJJ.

NSPS GG and KKKK: 40 CFR 60 Subparts GG and KKKK both include requirements for natural gas-fired turbines. Subpart GG applies to turbines with a heat input at peak load greater than 10 MMBtu/hr that are constructed, modified or reconstructed after October 3, 1977. Subpart KKKK applies to turbines with a heat input at peak load greater than 10 MMBtu/hr that are constructed, modified or reconstructed after February 18, 2005. The facility includes three natural gas-fired turbines: an Allison Model 501-KC5 (CG-1), a Solar Centaur Model 40-4700S (CG-7101) and a Solar Centaur Model 40-4700 (CG-7201).

As described in the Technical Review Document for the original issuance of the Operating Permit, CG-1 is subject to the requirements of Subpart GG.

CG-7101 was issued Construction Permit 05RB0312 on October 4, 2005. The source provided documentation that the turbine was purchased on December 14, 2004 and was therefore not subject to Subpart KKKK requirements. The Division agreed and included the appropriate requirements of Subpart GG in the Construction Permit.

The source submitted an application for a modification to Construction Permit 05RB0312 on February 29, 2008 requesting that CG-7101 be “uprated” (the turbine was originally installed and operated in a derated condition so that the output horsepower was limited by software programming in order to match customer demand at that time). The source provided information to show that the uprate project did not qualify as a

modification under NSPS definitions (which would have subjected the turbine to Subpart KKKK requirements). Modifications under NSPS must qualify as a "capital expenditure," which is defined as costing more than 3% of the total cost of the existing facility's basis. The Division confirmed that the cost of the uprate project was well below 3% of the total turbine installation cost and that the turbine did not become subject to Subpart KKKK requirements as a result of the project.

The source submitted an application to construct a new Solar Centaur gas-fired turbine (CG7201) on May 14, 2008 and was issued a Construction Permit (08RB0591) for this unit on November 18, 2009. This unit is subject to the requirements of Subpart KKKK.

Ambient Air Quality Modeling

The source completed modeling analyses as part of the initial approval construction application process for both of the Solar turbines (CG-7101 and CG-7201). The analyses showed that the equipment will not result in a NAAQS violation for NOx. The Division approved the analyses on September 22, 2008.

Compliance Assurance Monitoring (CAM) Applicability (40 CFR Part 64)

None of the significant emission units at this facility are equipped with control devices, therefore the CAM requirements do not apply. Although CG-7201 is equipped with a type of dry-low NOx (DLN) combustion system (SoLoNox), this configuration is not considered a control device as defined in 40 CFR Part 64 § 64.1, as adopted by reference in Colorado Regulation No. 3, Part C, Section XIV, since DLN is considered inherent process equipment.

New Unit: Solar Centaur 40-4700 natural gas-fired turbine (CG-7101, AIRS ID 006)

Unit CG-7101 was issued an Initial Approval Construction Permit on October 4, 2005. Final Approval was issued on January 10, 2007. The source requested a modification to uprate the turbine (as described above) and was issued an Initial Approval Construction Permit for this modification on November 18, 2008 (Modification No. 1). Note that the original APEN listed this unit with the identifier "CG-5," but the April 30, 2007 request to modify the Operating Permit requests that this unit be identified as "CG-7101."

CIG submitted notice that the uprate project was completed on December 22, 2008 and submitted self certification on May 19, 2009. The source has demonstrated compliance under the provisions of Regulation No. 3, Part B, Section III.G.2 for initial approval construction permit 05RB0312 (Modification No. 1) but not yet received a final approval construction permit. Under the provisions of Regulation No. 3, Part C, Section V.A.3., the Division will not issue a final approval construction permit and is allowing the initial approval construction permit to continue in full force and effect. The appropriate provisions of the initial approval construction permit have been directly incorporated into this operating permit.

1. Applicable Requirements

The appropriate applicable requirements are as follows:

- NO_x emissions shall not exceed 102.1 tons per year and CO emissions shall not exceed 18.8 tons per year. (Construction Permit 05RB0312)

- Consumption of natural gas as fuel shall not exceed 325 MMscf per year (Construction Permit 05RB0312).

- Maximum allowable particulate emissions standard for fuel burning equipment (Construction Permit 05RB0312 and Colorado Regulation No. 1, Section III.A.1.b):
  $PE = 0.5(FI)^{-0.26}$
  Where:
  PE = Particulate Emissions in pounds per million BTU heat input
  FI = Fuel input in million BTU per hour

- Maximum allowable SO_2 emissions standard (Construction Permit 05RB0312 and Colorado Regulation No. 1, Section VI.B.4.c.(i)): 0.8 pounds per million BTU of heat input.

  Although not specifically identified in the construction permit, the Reg 1 SO_2 limit is based on a 3-hour rolling average (Colorado Regulation No. 1, Section VI.B.2). This language is included in the operating permit condition.

- Particulate Matter emission limits for fuel burning equipment (Construction Permit 05RB0312 and Colorado Regulation No. 6, Part B, Section II.C):
  $PE = 0.5(FI)^{-0.26}$
  Where:
  PE = Particulate Emissions in pounds per million BTU heat input
  FI = Fuel input in million BTU per hour

  The Regulation No. 6, Part B particulate matter standard is the same as the Regulation No. 1 standard. Reg 6, Part B, Section I.A, adopts, by reference, the 40 CFR Part 60 Subpart A general provisions. The Division has determined during review of other recently issued operating permits that the NSPS standards are not applicable during startup, shutdown and malfunction. Because the Regulation 1 standard is applicable at all times, the Division considers it to be more stringent than the Regulation No. 6 standard. Therefore the Regulation No. 6, Part B requirements will be streamlined out of the permit.

- Standards for sulfur dioxide: 0.8 lb SO_2/MMBtu (Construction Permit 05RB0312 and Colorado Regulation No. 6, Section II.D.3).

This standard is the same as the Regulation No. 1 sulfur dioxide standard. As described for the Reg 1/Reg 6 particulate matter standards, the Division considers the Reg 1 standard to be more stringent, and therefore the Reg 6 standard is streamlined out.

- NO_x – 168 ppmvd by volume, dry basis, at 15% oxygen (40 CFR 60, Subpart GG, as adopted by reference in Colorado Regulation No. 6, Part A). compliance with the NO_x limit shall be determined by conducting the initial performance test required by 40 CFR 60 Subpart GG § 60.335. Thereafter, compliance with the NOx limit shall be monitored by conducting quarterly portable monitoring tests.

  Note that initial performance testing for this unit has been completed (as described below).

- SO_2 – 0.015 percent by volume, dry basis at 15% oxygen, or sulfur content in the fuel shall not exceed 0.8 percent by weight (40 CFR 60, Subpart GG, as adopted by reference in Colorado Regulation No. 6, Part A). Compliance with the sulfur dioxide emission limit and sulfur content limits shall be presumed when burning natural gas. The methods specified in 40 CFR Part 60 Subpart GG §60.334(h)(3) shall be used to demonstrate the natural gas meets the definition of natural gas.

  The Division included a reference to the definition of natural gas in Subpart GG in the operating permit condition.

- General Provisions of NSPS Subpart GG (Construction Permit 05RB0312 and Regulation No. 6, Part A, Subpart A).

  The Division updated the §60.11d language to the current version.

- Quarterly portable analyzer monitoring of turbine exhaust outlet emissions of NO_x and CO. Note that if the turbine is operated for less than 100 hours in any quarterly period, then portable monitoring requirements do not apply (Construction Permit 05RB0312).

- 20% opacity limits during normal operation of the source. 30% opacity for no more than six minutes in any sixty consecutive minutes during periods of startup, process modification or adjustment of control equipment. (Construction Permit 05RB0312 and Colorado Regulation No. 1, Sections II.A.1 and 4). EPA Method 9 shall be used to measure opacity.

  This turbine does not have a control device, so adjustment of control equipment does not apply. In addition, based on engineering judgment the Division believes that process modifications would be unlikely to occur for longer than 6 minutes. Therefore, the 30% opacity requirement has been included in the operating permit for only during startup of the unit.

Although not specifically identified in the construction permit, the source is also subject to the 20% opacity requirement in Colorado Regulation No. 6, Part B, Section II.3. The Reg 1 20% opacity applies at all times, except for the specific operating conditions under which the Reg 1 30% opacity requirement applies. Reg 6, Part B, Section I.A adopts by reference the 40 CFR Part 60 Subpart A general provisions. 40 CFR Part 60 Subpart A § 60.11(c) specifies that the opacity requirements are not applicable during periods of startup, shutdown and malfunction. The Reg 1 20%/30% requirements are more stringent than the Reg 6 Part B opacity requirements during periods of startup, shutdown and malfunction, while the Reg 6, Part B 20% opacity requirement is more stringent during fire building, cleaning of fire boxes, soot blowing, process modifications and adjustment or occasional cleaning of control equipment. However, as discussed previously, the Division considers that for the turbine the only specific activity under which the 30% opacity standard would apply is startup. Therefore, since the Reg 1 20%/30% opacity requirements are more stringent than the Reg 6, Part B requirements the Reg 6 Part B requirements have been streamlined out of the permit.

Additionally, the Division considers the use of pipeline quality natural gas to be sufficient for compliance demonstration with the opacity requirement; therefore the language regarding Method 9 is not included in the operating permit.

- Odor requirements of Regulation No. 2 (Construction Permit 05RB0312, state-only enforceable).

  Turbines are not generally a source of odor therefore this condition will not be specifically included in the permit but is included in the General Conditions (Section IV) of the operating permit.

- APEN reporting (Construction Permit 05RB0312 and Colorado Regulation No. 3, Part A, Section II.C.

  Note that APEN reporting requirements are included in the General Conditions (Section IV) of the operating permit.

- The following conditions of Construction Permit 05RB0312, Modification No 1 are one-time requirements that have been satisfied and therefore will not be incorporated in the Renewed Operating Permit:
  - Condition 1- Self-Certification: the source submitted a certification of compliance on May 19, 2009.
  - Condition 2 – Permit Expiration: The source provided a Notification of Startup for the turbine uprate project indicating that the project start-up date was December 22, 2008. Condition 2 states that the construction permit will expire if the modification does not commence within 18 months of issuance of the permit.

- Condition 3 – Stack Testing: the source conducted stack testing for the unit on April 8, 2009 to demonstrate compliance with the conditions of the permit and the requirements of NSPS GG. The Division approved the results of the stack test on May 15, 2009.
- Conditions 8.f and 8.g – Notification of Construction/Startup and Performance Test Requirements under Colorado Regulation No. 6, Part A, Subpart A, General Provisions: As noted above, notification of startup and performance testing requirements have been completed.

2. Emission Factors

Emissions from this turbine are produced during the combustion process, and are dependent upon operating conditions and specific properties of the natural gas being burned. The pollutants of concern are Nitrogen Oxides (NO_x) and Carbon Monoxide (CO). Emissions of PM, PM_{10}, and SO_2 are below APEN de minimis levels based on AP-42 emission factors (Table 3.1-2a, April 2000). Emissions of VOC are below APEN de minimis levels based on manufacturer's emission factors. Emissions of formaldehyde and acetaldehyde (which are HAPs – Hazardous Air Pollutants) have the potential to be emitted at levels above APEN de minimis levels based on HAPCalc (GRI Field) emission factors.

The manufacturer's emission factors are higher than AP-42 emission factors.

Pollutant	Solar Manufacturer Emission Factor (lb/MMBtu)	AP-42 Emission Factor (lb/MMBtu)
NOx	0.6610	0.32 (table 3.1-1)
CO	0.1220	0.082 (table 3.1-1)
VOC	0.0070	0.0021 (table 3.1-2a)

3. Monitoring Plan

The source will be required to monitor compliance with the NO_x and CO emission limits by monitoring natural gas consumption and calculating emissions monthly, and by conducting quarterly portable monitoring tests for NO_x and CO. The source will also be required to monitor the heat content of the natural gas used in the emission calculations on a semi-annual basis. The requirement for monitoring fuel content will be identical to that of the existing Allison Turbine (CG-1, AIRS ID 001), which allows the facility to use either the in-line gas chromatograph or the appropriate ASTM method.

In absence of credible evidence to the contrary, compliance with the Reg 1 particulate matter, opacity and SO_2 limits shall be presumed since only natural gas is permitted as a fuel. The source is required to demonstrate that the natural gas used as fuel meets the definitions of natural gas in NSPS Subpart GG in accordance with the methods specified in that Subpart.

40 CFR 60.334(e) allows that turbines not using water or steam injection to control NO_x emissions may monitor compliance using periodic testing approved by EPA or the State or local permitting authority. The turbine demonstrated compliance with an initial performance test as described above, and will be required to demonstrate compliance on an ongoing basis by conducting quarterly portable monitoring tests.

New Unit: Solar Centaur 40-4700S natural gas-fired turbine (CG-7201, AIRS ID 007)

Unit CG-7201 was issued Initial Approval Construction Permit No. 08RB0591 on November 18, 2008.

The due date of the first semi annual monitoring and deviation report required by this operating permit will be more than 180 days after the initial approval construction permit 97WE0180 was issued and/or the equipment commenced operation. Therefore, under the provisions of Regulation No. 3, Part C, Section V.A.2., the Division is allowing the initial approval construction permit to continue in full force and effect and will consider the Responsible Official certification submitted with that report to serve as the demonstration required pursuant to Regulation No. 3, Part B, Section III.G.2. and no final approval construction permit will be issued. The appropriate provisions of the initial approval construction permit have been directly incorporated into this operating permit.

1. Applicable Requirements

The appropriate applicable requirements are as follows:

- The Initial Approval construction permit shall expire if the owner or operator does not commence construction within 18 months after the date of permit issuance or the date on which construction was scheduled to commence as set forth in the permit application, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time of the estimated completion date. (Construction Permit 08RB0591). May 18, 2010 is 18 months after the issuance date of 08RB0591, Modification No. 1. CIG notified the Division that construction of the unit began on March 2, 2009. Therefore, this requirement will not be included in the Operating Permit.

- Initial performance testing for NO_x as required under Subpart KKKK §60.4400(a) and (b). (Construction Permit 08RB0591). The Division modified the language from the construction permit to include additional details regarding the requirements for submitting stack test protocols and scheduling the test, and to include the timeline required for initial performance testing as per NSPS Subpart A, §60.8.

- NO_x emissions shall not exceed 15.4 tons per year and CO emissions shall not exceed 18.8 tons per year. (Construction Permit 08RB0591)

- Consumption of natural gas as fuel shall not exceed 325 MMscf per year (Construction Permit 08RB0591).

- Maximum allowable particulate emissions standard for fuel burning equipment (Construction Permit 08RB0591 and Colorado Regulation No. 1, Section III.A.1.b):

  $PE = 0.5(FI)^{-0.26}$

  Where:

  PE = Particulate Emissions in pounds per million BTU heat input

  FI = Fuel input in million BTU per hour

- Maximum allowable SO_2 emissions standard (Construction Permit 08RB0591 and Colorado Regulation No. 1, Section VI.B.4.c.(i)): 0.8 pounds per million BTU of heat input.

  Although not specifically identified in the construction permit, the Reg 1 SO_2 limit is based on a 3-hour rolling average (Colorado Regulation No. 1, Section VI.B.2). This language is included in the operating permit condition.

- Particulate Matter emission limits for fuel burning equipment (Construction Permit 08RB0591 and Colorado Regulation No. 6, Part B, Section II.C):

  $PE = 0.5(FI)^{-0.26}$

  Where:

  PE = Particulate Emissions in pounds per million BTU heat input

  FI = Fuel input in million BTU per hour

  The Regulation No. 6 particulate matter standards have been streamlined out (see discussion for turbine CG-7101 above).

- Standards for sulfur dioxide: 0.8 lb SO_2/MMBtu (Construction Permit 08RB0591 and Colorado Regulation No. 6, Section II.D.3).

  The Regulation No. 6 sulfur dioxide standards have been streamlined out (see discussion for turbine CG-7101 above).

- NO_x – 100 ppm at 15% oxygen or 5.5 lb/MW-hr (Construction Permit 08RB0591 and 40 CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A).

- SO_2 – emissions shall not exceed 0.9 lb/MW-hr gross output, or the operator shall not burn any fuel that contains total potential sulfur emissions in excess of 0.060 lb SO_2/MMBtu heat input (Construction Permit 08RB0591 and 40 CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A).

- Operator must operate and maintain the stationary combustion turbine, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction (Construction Permit 08RB0591 and 40 CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A).

- NO_x monitoring – Annual performance tests as required per §60.4400, or implement a continuous parameter monitoring system per §60.430(b)(2). The monitoring plan must be established and documented per §60.4355(a). Construction Permit 08RB0591 and 40 CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A.

  CIG clarified that the facility will demonstrate compliance with the NO_x limits via the annual testing requirement of §60.4400 at this time. The CPMS option will not be included in the operating permit condition language.

- SO_2 monitoring - monitor the sulfur content of the natural gas in accordance with §60.4360 and §60.4370, or demonstrate that the natural gas meets the definitions of either pipeline natural gas or natural gas in accordance with §60.4365. Construction Permit 08RB0591 and 40 CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A.

  The source demonstrates that the natural gas used in the other turbines at the facility meets the definition of pipeline natural gas, which is also an allowable monitoring method under Subpart GG (40 CFR 60.334(h)(3)). Therefore, the operating permit will include the requirements of §60.4365 and not those of §§ 60.4360 & 60.4370.

- Excess Emission Reports (for units that continuously monitor parameters) – excess emissions must be reported for all periods of unit operation, including start-up, shutdown, and malfunction as per §60.4375(a). Construction Permit 08RB0591 and 40 CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A.

  Because CIG uses tariff sheet information to show that the fuel used meets the definition of natural gas (in order to monitor compliance with the SO_2 limitations) and has chosen annual performance testing as the method to show compliance with the NO_x limitations, the requirement for excess emission reports does not apply and therefore will not be included in the operating permit.

- Performance Test Results Reporting (for units that perform annual performance tests) – you must submit a written report of the results of each performance test before the close of business on the 60^{th} day following the completion of the performance test. Construction Permit 08RB0591 and 40

CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A.

- Excess emissions and monitor downtime (for units that continuously monitor parameters) must be evaluated when using a continuous parametric monitoring plan in accordance with §60.4380(c). Construction Permit 08RB0591 and 40 CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A.

  This unit will not use a CPMS to monitor compliance; this condition will not be included in the operating permit.

- All reports required under §60.7(c) must be postmarked by the 30th day following the end of each 6-month period. Construction Permit 08RB0591 and 40 CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A.

- Initial and subsequent performance tests must be conducted in accordance with §60.4400(a) and (b). Construction Permit 08RB0591 and 40 CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A.

- If a continuous parametric monitoring system is used, parametric monitoring ranges must be established per §60.4410. Construction Permit 08RB0591 and 40 CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A.

  A CPMS will not be used for this turbine; this condition is not included in the operating permit.

- Unless operator chooses to comply with §60.4365 for exemption of monitoring the total sulfur content of the fuel, then initial and subsequent performance tests for sulfur shall be conducted according to §60.4415. Construction Permit 08RB0591 and 40 CFR 60, Subpart KKKK, as adopted by reference in Colorado Regulation No. 6, Part A.

  The facility will comply with the requirements of §60.4365; this condition will not be included in the operating permit.

- New Source Performance Standards General Provisions (Construction Permit 08RB0591 and Regulation No. 6, Part A, Subpart A).

  The Division updated the §60.11d language to the current version.

- Quarterly portable analyzer monitoring of turbine exhaust outlet emissions of NO_x and CO. Note that if the turbine is operated for less than 100 hours in any quarterly period, then portable monitoring requirements do not apply (Construction Permit 08RB0591).

The Division will not require portable monitoring in any quarter in which a performance test was conducted as per the requirements of NSPS Subpart KKKK.

- 20% opacity limits during normal operation of the source. 30% opacity for no more than six minutes in any sixty consecutive minutes during periods of startup, process modification or adjustment of control equipment. (Construction Permit 05RB0312 and Colorado Regulation No. 1, Sections II.A.1 and 4). EPA Method 9 shall be used to measure opacity.

  This turbine does not have a control device (the dry-low NO_x system is determined to be integral to the process and is not control equipment), so adjustment of control equipment does not apply. In addition, based on engineering judgment the Division believes that process modifications would be unlikely to occur for longer than 6 minutes. Therefore, the 30% opacity requirement has been included in the operating permit for only during startup of the unit.

  Although not specifically identified in the construction permit, the source is also subject to the 20% opacity requirement in Colorado Regulation No. 6, Part B, Section II.3. However, these requirements have been streamlined out in favor of the Regulation No. 1 opacity requirements (see discussion for turbine CG-7101 above).

  Additionally, the Division considers the use of natural gas to be sufficient for compliance demonstration with the opacity requirement; therefore the language regarding Method 9 is not included in the operating permit.

- Odor requirements of Regulation No. 2 (Construction Permit 05RB0312, state-only enforceable).

  Turbines are not generally a source of odor therefore this condition will not be specifically included in the permit but is included in the General Conditions (Section IV) of the operating permit.

- APEN reporting (Construction Permit 05RB0312 and Colorado Regulation No. 3, Part A, Section II.C.

  Note that APEN reporting requirements are included in the General Conditions (Section IV) of the operating permit.

2. Emission Factors

Emissions from this turbine are produced during the combustion process, and are dependent upon operating conditions and specific properties of the natural gas being burned. The pollutants of concern are Nitrogen Oxides (NO_x) and Carbon Monoxide

(CO). Emissions of PM, PM_{10}, and SO_2 are below APEN de minimis levels based on AP-42 emission factors (Table 3.1-2a, April 2000). Emissions of VOC are below APEN de minimis levels based on manufacturer's emission factors. Emissions of formaldehyde and acetaldehyde (which are HAPs – Hazardous Air Pollutants) have the potential to be emitted at levels above APEN de minimis levels based on HAPCalc (GRI Field) emission factors.

The manufacturer's emission factors are higher than AP-42 emission factors for CO and VOC, and are lower than AP-42 emission factors for NOx due to the dry-low NO_x system.

Pollutant	**Solar Manufacturer Emission Factor (lb/MMBtu)**	**AP-42 Emission Factor (lb/MMBtu)**
NOx	0.1000	0.32 (table 3.1-1)
CO	0.1220	0.082 (table 3.1-1)
VOC	0.0035	0.0021 (table 3.1-2a)

3. Monitoring Plan

The source will be required to monitor compliance with the NO_x and CO emission limits by monitoring natural gas consumption and calculating emissions monthly, and by conducting quarterly portable monitoring tests for NO_x and CO. The source will also be required to monitor the heat content of the natural gas used in the emission calculations on a semi-annual basis. The requirement for monitoring fuel content will be identical to that of the existing Allison Turbine (CG-1, AIRS ID 001), which allows the facility to use either the in-line gas chromatograph or the appropriate ASTM method.

As required by NSPS Subpart KKKK, compliance with the NO_x emission standards will be monitored by conducting annual performance tests. In absence of credible evidence to the contrary, compliance with the Reg 1 particulate matter, opacity and SO_2 limits shall be presumed since only natural gas is permitted as a fuel. NSPS Subpart KKKK requires the source to demonstrate that the natural gas used as fuel meets the definitions of natural gas in order to show compliance with the Subpart KKKK SO_2 emission limitations.

III. Discussion of Modifications Made

Source Requested Modifications

The source's requested modifications identified in the modification application and the renewal application were addressed as follows:

Page following cover page

- Revised the permit contact information as requested per telephone correspondence with the source on July 14, 2009.

Section I – General Activities and Summary

- Updated Condition 1.1 to include the current facility configuration in the description of permitted activities.

- Added a reference to Construction Permits 05RB0312 and 08RB0591 in Condition 1.3 as this issuance of the Operating Permit will incorporate the applicable requirements of both permits.

- Updated the Summary of Emission Units Table in Condition 6.1: changed the Facility Identifier column to reference the current identification numbers in use at the facility, removed the Emission Unit Number column as these identifiers are not used, and added a row for the Solar Centaur 40-4700 Turbine (CG-7101) permitted under Construction Permit 05RB0312.

- Condition 6.1: Revised the serial number for the Allison turbine (AIRS ID 001) from ASP 1478 to ASP-1467. This turbine underwent routine maintenance by component exchange with replacement parts that resulted in a serial number change for the gas producer section. An Air Pollution Emission Notice (APEN) was provided on March 19, 2007 notifying the Division of the serial number change. The notification indicated that the combustion chamber replacement was with a like-kind unit and therefore, the Division agrees that the replacement is not considered a modification.

- Condition 6.1: Included the serial number for the Caterpillar engine (CG-4, AIRS ID 005), which was not available during the previous issuance of the Operating Permit. Corrected the model number from G3516-TALE-AFR to G3516LE-AFR.

- Condition 6.1: Corrected the model numbers for the Waukesha engines (CG-2, AIRS ID 002 and CG-3, AIRS ID 003) from 5108GL to L5108GL.

Section II – Specific Permit Terms

- Condition 1: Corrected the Facility Identifier for the Allison Turbine to CG-1

- Condition 1.1: Corrected the emission limit for the Allison Turbine (CG-1, AIRS ID 001) from 84.1 to 84.4 tons per year of NOx. The correction makes the emission limit consistent with the emission factor included in the permit (0.50 lb/MMBtu). The source submitted an APEN including the new NOx emission limit on August 5, 2009.

- Condition 2: Corrected the Facility Identifiers for the Waukesha Engines to CG-2 and CG-3.

- Condition 3: Corrected the Facility Identifier for the Caterpillar Engine to CG-4

- New Condition 4: Included a new condition for the CG-7101 Solar Centaur Turbine as described above. This condition displaces the portable monitoring condition (previously Condition 4, it is now numbered as Condition 6).

- Conditions 1.2.1.2, 4.2.1.2 and 5.2.1.2: After reviewing the draft renewal, the source requested that the SO_2 monitoring condition be modified to allow that compliance may be demonstrating by showing that the natural gas burned meets the definition of natural gas in 40 CFR Part 72, using the corresponding methods in Part 75, Appendix D. The condition previously referenced the definition of "pipeline quality natural gas" in 40 CFR Part 72, which has a lower sulfur content. NSPS Subpart GG allows compliance to be demonstrated by meeting the definition of natural gas , the definition of which has the same sulfur content as that in Part 72 (20.0 grains or less of total sulfur per 100 scf) (§60.334(h)(3)). NSPS Subpart KKKK also allows compliance demonstration based on 20.0 grains or less of total sulfur per 100 scf (§60.4365(a)). The requested change was therefore incorporated into the renewal.

Appendices

- Updated the list of safety equipment in Appendix A to include the information submitted in the April 30, 2007 application.

- Updated the facility plot plan to the one submitted in the construction permit application for 08RB0591, received May 14, 2008.

- Updated the list of insignificant activities to include information submitted in the modification application.

Other Modifications

In addition to the source requested modifications, the Division has included changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct errors or omissions identified during inspections and/or discrepancies identified during review of this renewal.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments to the CIG Greasewood Compressor Station Operating Permit. These changes are as follows:

Page Following Cover Page

- It should be noted that the monitoring and compliance periods and report and certification due dates are shown as examples. The appropriate monitoring and compliance periods and report and certification due dates will be filled in after permit issuance and will be based on permit issuance date. Note that the source may request to keep the same monitoring and compliance periods and report and certification due dates as were provided in the original permit. However, it should be noted that with this option, depending on the permit issuance date, the first

monitoring period and compliance period may be short (i.e. less than 6 months and less than 1 year).

- Modified the language concerning postmarked dates for report submittals to reflect the Division's current standard language.

Section I – General Activities and Summary

- Revised the language in Condition 1.4 include current conditions that are state-only enforceable.

- Updated the Alternative Operating Scenarios for Turbines language in Condition 2 to reflect the Division's current language (8/23/2006).

- Updated the PSD language in Condition 3.1 to reflect the Division's current standard language.

- Added a row in the Summary of Emission Units in Condition 6.1 to include the Solar Centaur 40-4700S turbine (CG-7201), permitted under Construction Permit no. 08RB0591.

Section II – Specific Permit Terms

- Based on a comment received from EPA on a recently issued permit, minor language changes were made to the conditions and the tables for all turbines and compressor engines to state that only natural gas is permitted to be used as a fuel.

- Table 1 (Condition 1.1): updated the annual CO permit limit to include an additional significant figure.

- Condition 1.1 – corrected the citation to the portable monitoring condition from 1.1.2 to 1.1.1.2.

- Condition 1.1.1.1, 2.1.1 and 3.1.1 – updated the language related to calculation of emissions based on portable monitoring test results to the Division's current standard language. The Division no longer allows the use of emission factors other than those approved as listed in the permit, and any portable analyzer results showing that emissions or factors are higher than those listed require the permit holder to apply for a permit modification within 60 days of the test.

- Condition 1.1.2.2 includes a requirement to conduct a performance test on the Allison Turbine in the third year of the permit, which would be February 1, 2006 – February 1, 2007. Testing was conducted on August 17, 2006 and was approved by the Division on October 31, 2006. In the original Title V permit, the Division required that performance testing be conducted on the turbine twice per permit term to monitor compliance with the NSPS GG NOX limit. Based on the results of the initial performance test (conducted in 1994) and the two tests required by the initial Title V

permit (all results were 65% or less of the NSPS GG limit), the Division determined that the single performance test during the third year of the renewal permit was sufficient. The Division determines that for this second renewal permit, ongoing quarterly portable monitoring testing is sufficient to demonstrate compliance with the NO_x limit and will not require additional performance tests for this unit. Therefore, Condition 1.1.2.2 has been removed.

- Included a new Condition No. 5 to incorporate the requirements of the CG-7201 Solar Centaur turbine as described above.

- Updated the portable monitoring condition to the Division's current standard language (6/2/2006).

Section IV – Permit Shield

- Corrected the regulatory citation for the permit shield

- The permit shield included a statement that Regulation 1, Section III.A (particulate emissions for fuel burning equipment) was not applicable to all units at the facility except for the Allison Turbine. Although it is true that the engines do not qualify as fuel burning equipment under Section III.A, the requirement does apply to other equipment at the facility that qualifies as insignificant activities (heaters, boilers, etc.). Therefore, the entry was reworded to state that the requirement does not apply to the compression engines.

- Removed language referencing 112(j). Since the EPA has signed off on final rules for all of the source categories which were not promulgated by the deadline, the case-by-case MACT provisions in 112(j) no longer apply.

- The permit shield includes a statement related to the non-applicability of 40 CFR 63 Subpart HH that it is not a major source of HAPs. Because this rule has since been amended to include area sources, this statement was deleted.

- Colorado Regulation No. 6, Part B requirements for particulate matter emissions, opacity and SO_2 emissions were streamlined out for the new turbines (CG-7101 and CG-7201) as described above. Note the same situation applies to the existing Allison Turbine (CG-1). Citations to the conditions for the new turbines were added to the streamlined conditions table.

Section V – General Permit Conditions

- Updated the general permit conditions to the current version (7/21/2009).

Appendices

- Updated Appendices B and C (Monitoring and Permit Deviation Reports and Compliance Certification Reports) to the newest versions (2/20/2007).

- EPA’s mailing address was revised (Appendix D).

ATTACHMENT 1 – Facility-Wide Potential Emissions

Emission Unit	NOx	VOC	CO	Formaldehyde	Total HAPs
E001 – Allison Turbine, Model 501-KC5	84.4	0.9	12.7	0.12	0.12
E002 – Waukesha 5180GL Engine	12.9	8.6	22.9	1.43	1.80
E003 – Waukesha 5180GL Engine	12.9	8.6	22.9	1.43	1.80
E005 –Caterpillar G3516TALE-AFR Engine	14.7	5.3	17.6	1.76	2.21
E006 – Solar Centaur 40-4700 Turbine	102.1	1.1	18.8	0.62	1.26
E007 – Solar Centaur 40-4700S Turbine	15.4	0.5	18.8	0.62	1.26
TOTAL (permitted units)	**242.6**	**24.8**	**113.5**	**5.98**	**8.45**
Insignificant Activities	1.7	0.6	1.6	0.1	0.1
Insignificant Activities (fugitive)		0.09			

Potential emissions for NOx, VOC and CO are based on permit limits. Potential formaldehyde and other HAP emissions are based on AP-42 Emission Factors (Chapter 3.1 for turbines (April, 2000) and Chapter 3.2 for engines (April, 2000). Emissions from insignificant activities are as reported in the modification application.